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Amendments to the Claims:

1 - 42 (Cancelled)

43. (New) A bone graft substitute composition, comprising:
100 parts by weight of calcium sulfate hemihydrate;
about 1 to about 10 parts by weight of a plasticizing substance; and
an aqueous mixing solution, wherein the composition is provided in a form suitable for use as a bone graft substitute.

44. (New) The composition of Claim 43, wherein the plasticizing substance comprises a cellulose derivative.

45. (New) The composition of Claim 43, wherein the plasticizing substance is selected from the group consisting of sodium carboxymethylcellulose, methylcellulose, hydroxypropyl methyl cellulose, hydroxypropyl cellulose, ethylcellulose, hydroxyethylcellulose, and cellulose acetate butyrate.

46. (New) The composition of Claim 43, wherein the plasticizing substance comprises hydroxypropyl methyl cellulose.

47. (New) The composition of Claim 43, wherein the plasticizing substance comprises hydroxypropyl cellulose.

48. (New) The composition of Claim 43, wherein the plasticizing substance comprises hyaluronic acid.

49. (New) The composition of Claim 43, wherein the plasticizing substance comprises methylcellulose.

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50. (New) The composition of Claim 43, wherein the aqueous mixing solution comprises sterile water.
51. (New) The composition of Claim 43, wherein the aqueous mixing solution comprises an inorganic salt.
52. (New) The composition of Claim 43, wherein the aqueous mixing solution comprises a cationic surface active agent.
53. (New) The composition of Claim 52, wherein the cationic surface active agent is selected from the group consisting of sodium chloride, phosphate buffered saline, potassium chloride, sodium sulfate, ammonium sulfate, ammonium acetate, and sodium acetate.
54. (New) The composition of Claim 43, comprising about 1 to about 7 parts by weight of the plasticizing substance.
55. (New) The composition of Claim 43, comprising about 2 to about 6 parts by weight of the plasticizing substance.
56. (New) The composition of Claim 43, comprising about 20 to about 40 parts by weight of the aqueous mixing solution.
57. (New) The composition of Claim 43, comprising about 20 to about 35 parts by weight of the aqueous mixing solution.
58. (New) The composition of Claim 43, wherein the composition is provided in a form suitable for insertion in an injection apparatus and ejection through a 1/8 inch diameter orifice into a surgical site.

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59. (New) The composition of Claim 43, wherein the composition is capable of being handled and shaped into a form suitable for positioning in a surgical site.

60. (New) The composition of Claim 43, consisting essentially of 100 parts by weight of calcium sulfate hemihydrate, about 1 to about 10 parts by weight of a plasticizing substance, and an aqueous mixing solution.

61. (New) The composition of Claim 43, consisting of 100 parts by weight of calcium sulfate hemihydrate, about 1 to about 10 parts by weight of a plasticizing substance, and an aqueous mixing solution.

62. (New) A bone graft substitute composition, comprising:
100 parts by weight of medical grade calcium sulfate hemihydrate;
about 1 to about 10 parts by weight of a plasticizing substance, wherein the plasticizing substance is selected from the group consisting of sodium carboxymethylcellulose, methylcellulose, hydroxypropyl methyl cellulose, hydroxypropyl cellulose, ethylcellulose, hydroxyethylcellulose, and cellulose acetate butyrate; and
about 20 to about 65 parts by weight of an aqueous mixing solution, wherein the composition is provided in a form suitable for use as a bone graft substitute and capable of being handled and shaped into a form suitable for positioning in a surgical site.

63. (New) The composition of Claim 62, comprising about 1 to about 7 parts by weight of the plasticizing substance.

64. (New) The composition of Claim 62, comprising about 2 to about 6 parts by weight of the plasticizing substance.

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65. (New) The composition of Claim 62, comprising about 20 to about 40 parts by weight of the aqueous mixing solution.

66. (New) The composition of Claim 62, comprising about 20 to about 35 parts by weight of the aqueous mixing solution.

67. (New) The composition of Claim 62, wherein the aqueous mixing solution comprises sterile water.

68. (New) A bone graft substitute composition, comprising:
100 parts by weight of calcium sulfate hemihydrate;
about 1 to about 10 parts by weight of a plasticizing substance, wherein the plasticizing substance comprises a cellulose derivative or hyaluronic acid; and
about 20 to about 65 parts by weight of an aqueous mixing solution, wherein the composition is provided in a shape suitable for insertion into a surgical site or loaded into an injection apparatus suitable for ejecting the composition into a surgical site.

69. (New) A method of treating a patient having a bone defect, comprising:
providing a bone graft substitute composition according to Claim 43; and
applying the bone graft substitute composition to the site of the bone defect in the patient.

70. (New) A method of treating a patient having a bone defect, comprising:
providing a bone graft substitute composition according to Claim 62; and
applying the bone graft substitute composition to the site of the bone defect in the patient.

71. (New) A method of treating a patient having a bone defect, comprising:
providing a bone graft substitute composition according to Claim 68; and
applying the bone graft substitute composition to the site of the bone defect in the patient.

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